

YOKOYAMA et al. - 09/849,344  
Client/Matter: 041411-0277195

### REMARKS

Claims 1 and 3-5 are pending.

Claims 1 and 5 were rejected under 35 U.S.C. § 102(b) over Nakamura et al. (U.S. Patent No. 5,518,390). The rejection is respectfully traversed.

Claim 1 recites an injection control method for a die-casting machine, wherein molten material is injected into a casting mold by an injection cylinder unit. The method includes setting target velocity data specifying an injection operation required for the injection cylinder in advance and performing a first shot of an injection operation, and recording command data provided to the injection cylinder unit and detecting velocity data indicating the operation performed by the injection cylinder unit during the first shot of the injection operation. The method further includes determining a difference between the detected velocity data and the target velocity data and calculating a correction value based on the difference and using the calculated correction value and generating command data for a second shot of the injection operation. The method further includes operating the injection cylinder unit by providing to it the command data for the second shot of the injection operation. The correction is obtained by operating the injection cylinder unit for a predetermined number of the injection shots by ordinary injection position feedback control and after the predetermined number of the injection shots by the ordinary injection position feedback control, control is shifted to open loop control of injection velocity by command data generated from the correction value and the previous command data.

There is no disclosure or suggestion by Nakamura et al. that the correction value is obtained by operating the injection cylinder unit for predetermined number of the injection shots by ordinary injection position feedback control, and after the predetermined number of injection shots by the ordinary injection position feedback control, shifting control to the open loop control of injection velocity by command data generated from the correction value and the previous command data, as recited in claim 1.

The November 13, 2003 Office Action alleges that this feature of claim 1, which was previously recited in dependent claim 2, is disclosed in column 3, lines 60-67 and column 4, lines 1-29 of Nakamura et al. However, column 3, lines 60-column 4 line 29 of Nakamura et al. merely discloses that the correction value  $A_v$  for the next shot of an injection operation is obtained by comparing the speed measurement  $V_d$  from the speed sensor 16 to the speed set point  $V_s$  and by comparing the pressure measurement  $P_d$  from the pressure sensor 17 to the pressure set point  $P_s$ . Nakamura et al. do not disclose or suggest that the correction value  $A_v$  for

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a current injection operation is obtained. In other words, the speed measurement of Nakamura et al. is not feedback controlled in the current injection operation. Therefore, Nakamura et al. do not disclose or suggest that correction value is obtained by the ordinary injection position feedback control for a predetermined number of shots and then shifted to open loop control of injection velocity as recited in claim 1.

The May 17, 2004 Office Action on page 3, lines 9-11, incorrectly states that Nakamura et al. disclose "subsequently shifting to open loop control of the injection cylinder using the correction value (column 2, lines 49-56; column 3, lines 4-15; column 4, lines 30-37)." Applicants first respectfully note that claim 1 recites that control is shafted to open loop control of injection velocity by command data generated from the correction value and the previous command data, not by using the correction value, as alleged by the Office Action and as disclosed by Nakamura et al. Applicants also respectfully note that column 2, lines 55-56 disclose that the speed control of the actuator 2 of Nakamura et al. becomes basically open loop control. However, implicit in this disclosure is that feedback control is used when a deviation does occur. Column 3, lines 4-15, noted in the Office Action, is a description of a feedback control, not an open loop control. See, for example, column 1, lines 20-30, of Nakamura et al. which disclose that feedback control is comparison between a command value and a detected value. Column 3, lines 4-15 of Nakamura et al. is clearly a description of feedback control, not open loop control.

Applicants further respectfully note that column 4, lines 30-37, discloses the process of Nakamura et al. begins with the entry of the speed set point  $V_s$  and the pressure set point  $P_s$  into the input member 31 which causes the control member 15 to control the hydraulic drive circuit 14 to be driven according to open loop control. As further disclosed in column 4, lines 47-53 of Nakamura, during open loop control of the hydraulic drive circuit 14, the speed measure  $V_d$  and pressure measurement  $P_d$  are provided to the processing member 4 for calculation of the correction value  $A_v$ . Accordingly, Nakamura et al. merely disclose open loop control of the hydraulic drive circuit 14 for calculation of the correction value  $A_v$ , not open loop control of injection velocity by command data generated from the correction value and previous command data, as recited in claim 1.

As Nakamura et al. do not disclose or suggest at least these features of claim 1, it is respectfully submitted that Nakamura et al. cannot present a *prima facie* case of obviousness against claim 1.

Claim 5 recites additional features of the invention and is allowable for the same reasons discussed above with respect to claim 1 and for the additional features recited.

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Reconsideration and withdrawal of the rejection of claims 1 and 5 are respectfully requested.

Claims 3 and 4 were rejected under 35 U.S.C. § 103(a) over Nakamura et al. in view of Bulgrin (U.S. Patent No. 5,997,778). The rejection is respectfully traversed.

Claims 3 and 4 recite additional features of the invention and are allowable for the same reasons discussed above with respect to claim 1 and for the additional features recited therein.

Furthermore, it is respectfully submitted that Bulgrin fails to cure the deficiencies of Nakamura et al. with respect to claim 1, and even assuming it would have been obvious to combine the reference teachings, the combination would not include all the features of claim 1 and would fail to present a *prima facie* case of obviousness against claim 1.

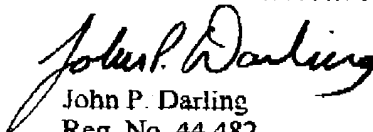
Reconsideration and withdrawal of the rejection of claims 3 and 4 are respectfully requested.

In view of the above remarks, Applicants respectfully submit that all of the claims are allowable and that the entire application is in condition for allowance.

Should the Examiner believe that anything further is desirable to place the application in condition for allowance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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